



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/040,717 | 01/07/2002 | Wolfgang Singer | 637.0016USU | 1778 |

7590 05/27/2005

Charles N.J. Ruggiero, Esq.
Ohlandt, Greeley, Ruggiero & Perle, L.L.P.
10th Floor
One Landmark Square
Stamford, CT 06901-2682

EXAMINER

HO, ALLEN C

ART UNIT PAPER NUMBER

2882

DATE MAILED: 05/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/040,717

Applicant(s)

SINGER ET AL.

Examiner

Allen C. Ho

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3-16, 19-21 and 24-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3-13 and 19 is/are allowed.
- 6) ☒ Claim(s) 14-16, 20, 21 and 24-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 20, 21, 24, and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Mori *et al.* (U. S. Patent No. 5,594,526).

With regard to claims 20 and 24, Mori *et al.* disclosed an illumination system, comprising: an optical element (50) having a first raster element (510) on a raster element plate (53) and a second raster element (520) on the raster element plate, wherein the first aspect ratio is not equal to the second aspect ratio (column 14, lines 37-42), and wherein the illumination system defines a segment of a ring field (column 4, lines 22-29).

With regard to claims 21 and 25, Mori *et al.* disclosed an illumination system for radiation wavelengths ≤ 193 nm, comprising: an optical element (50) having a first raster element (510) on a raster element plate (53) and a second raster element (520) on the raster element plate, wherein the first and second raster elements of different sizes (column 14, lines 37-42), wherein the illumination system defines a field to be illuminated in an object plane of the

Art Unit: 2882

illumination system, and wherein the field represents a segment of a ring field (column 4, lines 22-29).

3. Claims 14-16, 26, and 27 are rejected under 35 U.S.C. 102(e) as being anticipated by Tanitsu *et al.* (U. S. Patent No. 6,741,394 B1).

With regard to claim 14, Tanitsu *et al.* disclosed an illumination system comprising: a first optical element (230), which is divided into first raster elements and lies in a first plane; wherein at least two (231, 232) of the first raster elements have aspect ratio of different magnitude (column 33, lines 54-67); wherein the illumination system defines a field to be illuminated in an object plane of the illumination system, and wherein the field represents a segment of a ring field (column 34, lines 28-47).

With regard to claim 15, Tanitsu *et al.* disclosed a projection exposure system comprising: (a) an illumination system having: a first optical element (230), which is divided into first raster elements and lies in a first plane, wherein at least two (231, 232) of the first raster elements have aspect ratio of different magnitude (column 33, lines 54-67); (b) an exit pupil (250); (c) a pattern-bearing mask (R); (d) a projection device (PL); (e) a light-sensitive substrate (W).

With regard to claim 16, Tanitsu *et al.* disclosed a method for producing microelectronic components, comprising using the projection exposure system according to claim 15 (column 19, lines 20-33).

With regard to claim 26, Tanitsu *et al.* disclosed an optical element having a first raster element (231) situated substantially in a plane and a second raster element (232) situated in the plane, wherein the first raster elements and the second raster elements are of different sizes (Fig.

Art Unit: 2882

14B), wherein the illumination system defines a field to be illuminated in an object plane of the illumination system, and wherein the field represents a segment of a ring field (column 34, lines 28-47).

With regard to claim 27, Tanitsu *et al.* disclosed the illumination system of claim 26, wherein the first and the second raster elements are reflective (lens reflects light as well as transmits it).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 21 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cohen *et al.* (U. S. Patent No. 5,737,137).

With regard to claim 21, Cohen *et al.* disclosed an illumination system for radiation wavelengths ≤ 193 nm, comprising: an optical element (10) having a first raster element (11) and a second raster element (12) of different sizes (column 4, lines 53-59), wherein the illumination system defines a field to be illuminated in an object plane of the illumination system, and wherein the field represents a segment of a ring field (column 3, lines 64-66).

However, Cohen *et al.* failed to disclose a support structure that supports the first raster element and the second raster element.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a support structure to support the first raster element and the second raster element, since a person would be motivated to maintain a structural integrity of the illumination system and to maintain a geometrical relationship between the first raster element and the second raster element.

With regard to claim 25, Cohen *et al.* disclosed the illumination system according to claim 21. However, Cohen *et al.* failed to teach that the support structure is a raster element plate.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a raster element plate to support the first raster element and the second raster element, since a person would be motivated to provide a support structure of any size and shape as demanded and consistent with engineering requirements.

Allowable Subject Matter

6. The indicated allowability of claims 14-16 is withdrawn in view of the newly discovered reference(s) to Tanitsu *et al.* (U. S. Patent No. 6,741,394 B1).

7. Claims 3-13 and 19 are allowed.

8. The following is a statement of reasons for the indication of allowable subject matter:

With regard to claims 3-8 and 12, although the prior art discloses illumination systems for lithography with wavelengths ≤ 193 nm comprising a first optical element divided into first raster elements and lies in a first plane, wherein at least two of the first raster elements have different aspect ratios, and a second optical element divided into second raster elements, it fail to

Art Unit: 2882

teach or fairly suggest that at least some of the second raster elements have an anamorphic optical effect such that an aspect ratio of images of the first raster elements is substantially the same in the object plane independent of the aspect ratio of the first raster elements as claimed in claim 1.

With regard to claims 9-11, 13, and 19, although the prior art discloses illumination systems for lithography with wavelengths ≤ 193 nm comprising a first optical element divided into first raster elements and lies in a first plane, wherein at least two of the first raster elements have different aspect ratios, it fails to teach or fairly suggest that all of the first raster elements are completely illuminated in the first plane as claimed in claim 9.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- (1) Komatsuda (U. S. Patent No. 6,833,904 B1) disclosed an exposure apparatus.
- (2) Robinson *et al.* (U. S. Patent No. 6,260,972 B1) disclosed a liquid crystal projector comprising a plurality of raster elements of different aspect ratios and sizes.
- (3) Tanitsu (U. S. Patent No. 5,912,725) disclosed an illumination system comprising a plurality of raster elements having quadrangular cross section.
- (4) Shimizu *et al.* (U. S. Patent No. 5,662,401) disclosed a plurality of raster elements of different sizes.

Art Unit: 2882

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen C. Ho whose telephone number is (571) 272-2491. The examiner can normally be reached on Monday - Friday from 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward J. Glick can be reached at (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Allen C. Ho
Primary Examiner
Art Unit 2882

25 May 2005